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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/091,503

03/07/2002

Eiji Okamoto

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05/17/2005

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EXAMINER

PANWALKAR, VINEETA S

ART UNIT

PAPER NUMBER

2631

DATE MAILED: 05/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/091,503

Applicant(s)

OKAMOTO, EIJI

Examiner

Vineeta S. Panwalkar

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 March 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/19/03, 07/06/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. Drawings are objected to as to minor informalities.
 - Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
 - In Fig. 4(a), "Vetervi decoder" should be relabeled "Viterbi decoder".

Specification

3. The disclosure is objected to because of the following informalities:
- On Page 7, paragraph [0046], the term “minimum squared Euclidean distance” should be changed to read “Minimum Squared Euclidean Distance”, with capitalized letters reflecting the acronym used. Also, the acronyms MSD and MPD are used for the first time in the disclosure, but there is no mention of what they stand for.
 - On Page 8, paragraph [0050], the terms “minimum symbol distance”, “minimum product distance” and “(signal/noise ratio)” should be changed to read “Minimum Symbol Distance”, “Minimum Product Distance” and “(Signal/Noise ratio)” respectively, with the capitalized letters reflecting the acronym used.
 - On Page 4, paragraph [0030], “Fig. 4 (b).” should be changed to read ...Fig. 9 (b).... as the signal points for modes 2 and 4 are shown in Fig. 9 (b).
 - On Page 9, paragraph [0052], “Fig. 1.” should be changed to read ...Fig. 4 (b)....as the Viterbi decoding of code 2 using the trellis diagram is shown in Fig. 4(b).

Appropriate correction is required.

Tables 1 and 2 are objected to as to minor informalities.

In tables 1 and 2, the correspondence of the left hand side column to the right hand side column is not clear. It is suggested that the applicant draw horizontal lines to separate individual row entries.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. The incorporation of essential material in the specification by reference to a foreign application or patent, or to a publication is improper. Applicant is required to amend the disclosure to include the material incorporated by reference. The amendment must be accompanied by an affidavit or declaration executed by the applicant, or a practitioner representing the applicant, stating that the amendatory material consists of the same material incorporated by reference in the referencing application. In re Hawkins, 486 F.2d 569, 179 USPQ 157 (CCPA 1973); In re Hawkins, 486 F.2d 579, 179 USPQ 163 (CCPA 1973); In re Hawkins, 486 F.2d 577, 179 USPQ 167 (CCPA 1973);

The attempt to incorporate subject matter into this application by reference to "The Design of Trellis Coded MPSK for Fading Channels: Performance

Criteria" by D. Divsalar and M.K. Simon, (IEEE Transactions on Communications, Vol. 36, No.9, pp. 1004-1012, September 1988) is improper because the applicant has disclosed results based on the teachings of the reference in tables 1 and 2, without disclosing the steps involved in obtaining these results.

5. Claim 5-8 and 10-13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. It seems that the applicant has incorporated critical subject matter by reference to the IEEE publication mentioned above.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. The claims are generally narrative and indefinite, failing to conform with current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors.

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For example, it is not clear from the language of claim 10, what the applicant is trying to convey with regards to the signal.

Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01.

- Claims 1 and 10 recite method claims, but show neither the steps involved in achieving the claimed method, nor the relationship between the steps.

- Claims 2-9 and 11-13 are inherently rejected under 35 U.S.C. 112, second paragraph, as being dependent on a rejected base claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Ungerboeck in "Channel Coding with Multilevel/Phase Signals", (IEEE Transactions on Information Theory, Vol. IT-28, No.1, pp. 55-67, January 1982), hereafter referred to as Ungerboeck.

Regarding claim 1, Ungerboeck describes a channel coding method comprising:

- a multi-mode block-coded modulation/demodulation method that performs one-way transmission of a multi-mode digital signal by using, between at least two different modes (PSK and QAM), different settings for number of levels (Fig. 1, 8-PAM and 16-QAM), code of levels (Fig. 1, 8-PAM and 16-QAM), method of set-partitioning (Fig. 4) and method of modulation (Fig. 1, PAM and QAM) that are component elements of a multi-level block-coded modulation system. (Page 58, left column, next to last paragraph).

Regarding claim 9, Ungerboeck further discloses the step of:

- multi-mode transmission that is carried out in which numbers of transmission symbols are identical to numbers of block code bits. (Fig. 1 and Fig. 4 and Page 58, left column, next to last paragraph. 8-PSK and 16-QASK are interpreted as two different modes i.e. the claimed multi-mode and each symbol in each mode has identical number of bits per code. For example, all codes in 8-QAM have 3 bits).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ungerboeck in view of Kaewell, Jr. (US 6256339), hereafter referred to as Kaewell.

Regarding claim 2, Ungerboeck discloses all the limitations of claim (See paragraph 7 above).

However, Ungerboeck is silent regarding the changing of the modes.

In the same filed of endeavor, however, Kaewell discloses a multichannel Viterbi decoder comprising:

- the step of changing modes for each block code frame. (Column 3, lines 47-52).

Thus, it would be obvious to a person of ordinary skill in the art to use different modes for each frame, as Kaewell's teachings suggest that the transmission of various data rates increases the signal-to-noise ratio

(SNR) to all receivers and optimizes the communication system. (Column 2, lines 2-4).

Regarding claim 3, Ungerboeck discloses all the limitations of the claim (See Paragraph 7 above).

However, Ungerboeck is silent regarding the number of decoders required to decode all the modes.

In the same filed of endeavor, however, Kaewell discloses a multichannel Viterbi decoder comprising:

- the step of maximum likelihood decoding that is carried out on a receiving side by a single Viterbi decoder which uses a trellis diagram that includes all modes. (Column 4, lines 20-37).

Thus, it would be obvious to a person of ordinary skill in the art to use a single Viterbi decoder, as Kaewell's teachings suggest that the single decoder provides reduced complexity and increased performance and that the SNR of the received signals is effectively increased (Column 2, lines 62-64 and column 4, lines 38-39).

Regarding claim 4, Ungerboeck discloses all the limitations of the claim (See Paragraph 7 above).

However, Ungerboeck is silent regarding the specifics of the multi-mode decoding.

In the same filed of endeavor, however, Kaewell discloses a multichannel Viterbi decoder comprising:

- the step of mode selection and decoding that are carried out simultaneously on the receiving side by performing Viterbi decoding.. (Column 4, lines 20-37).

Thus, it would be obvious to a person of ordinary skill in the art to use Viterbi decoding, as Kaewell's teachings suggest that the SNR of the received signals is effectively increased. (Column 4, lines 38-39).

9. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ungerboeck in view of Imai et al. in "A New Multilevel Coding Method Using Error-Correcting Codes", (IEEE Transactions on Information Theory, Vol. IT-23, No.3, pp. 371-377, May 1977), hereafter referred to as Imai.

Ungerboeck discloses all the limitations of the claim (See Paragraph 7 above).

However, Ungerboeck is silent regarding unequal error protection.

In the same filed of endeavor, however, Imai discloses multilevel coding method comprising:

- the step of using at each level an error-protected transmission signal that contains an unequal error protection portion that differs according to a mode and an equal error protection portion. (Fig. 1 and Page 371,

right-hand column, first paragraph of Section II. The different rates, k_i/n_i provide the unequal and equal error protection, depending on inequality and equality respectively of the values of k and n).

Thus, it would be obvious to a person of ordinary skill in the art to use equal and unequal error protection, as Imai's teachings suggest that efficient communication systems can be obtained by choosing these error correcting codes appropriately. (Page 377, left-hand column, first paragraph of Section V).

Other Prior Art Cited

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
 - Borrás (US 5175872) discloses a combined trunked/cellular communication unit.
 - Seshadri et al. (US 5289501) disclose coded modulation with unequal error protection for fading channels.
 - Hemmati (US 5394439) discloses a BISDN compatible modem.
 - Chouly et al. (US 5416801) disclose a digital signal transmission system.
 - Alamouti et al. (US 5659578) disclose a high rate Trellis coded QAM system.

- Hu et al. (US 5914988) disclose a digital packet data coded Trellis decoder.
- Onodera et al. (US 6422146) disclose a TDMA communication system.
- Ogino (US 6813309) discloses a CDMA receiving method and circuit.

Contact Information

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vineeta S. Panwalkar whose telephone number is 571-272-8561. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

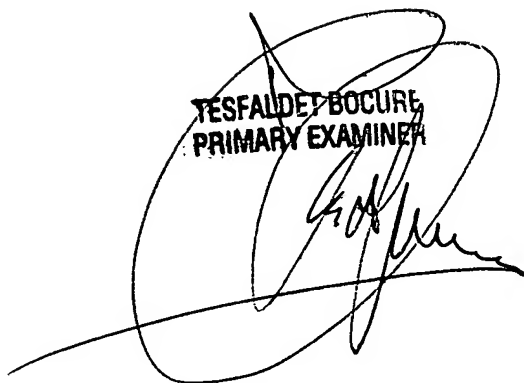
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on

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access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

V.P.

YESFAUDET BOCURE
PRIMARY EXAMINER

A handwritten signature in black ink, appearing to read 'Yesfaudet Bocure', is written over a rectangular stamp. The signature is stylized and overlaps the text of the stamp.